

Station 1: Answers

Post Lab Questions:

1. What type of compound conducts electricity?

Ionic compounds

2. Did the state of matter affect the conductivity of the sample?

Yes, only in liquid state

3. What conclusions can be made about ionic and molecular compounds' conductivity?

- ***Ionic compounds in liquid state conduct electricity because there is a free metal.***
- ***Molecular compounds never conduct electricity because there are no metals.***

****** Remember only metals conduct electricity******

STATION 2: Answers

Examine the graph of Electronegativity vs. Atomic Number.

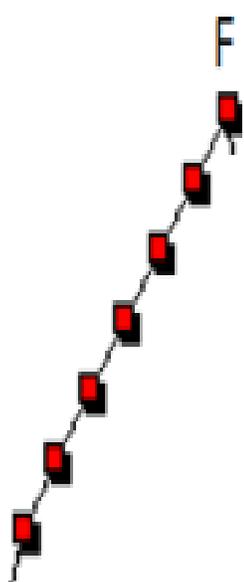
1. Which element has the highest electronegativity value?

Fluorine

2. Why do He, Ne, and Ar have electronegativity values of zero?

These elements are already stable, have all 8 valence electrons.

3. What is the general electronegativity trend as atomic number increases, but number of energy levels remains constant? Why do you think this trend occurs?



The electronegativity increases as the atomic number increases but the energy level is constant. There is more attraction between the nucleus and the valence electrons because there are more protons in the nucleus. The increase attraction increases the ability for the atom to attract another electron within a bond.

STATION 3: Answers

Examine the table of Electronegativity Values.

1. Which elemental family is excluded from this table? Why do you think this family has been excluded?

Noble gases. It was excluded because they are already stable; they have all 8 valence electrons.

2. In general, do metals or nonmetals have a greater attraction for electrons in a chemical bond? Why do you think this is?

Nonmetals have a greater attraction for the electron because nonmetals tend to have more attraction between the nucleus and the valence electrons due to the increase amount of protons in the nucleus

STATION 5: Answers

- Record the electronegativity value for each element below.
 - Sodium (Na) **0.9**
 - Chlorine (Cl) **3.0**
 - Phosphorus (P) **2.1**
- For each bond below, determine the atom that would have the highest attraction for the electrons in the chemical bond.
 - Na and Cl **Chlorine**
 - P and Cl **Chlorine**
 - Cl and Cl **Chlorine**
- Calculate the electronegativity difference (Δ EN) between the atoms in each bond below. You may express your answers as positive values.
 - Na and Cl **$3.0 - 0.9 = 2.1$**
 - P and Cl **$3.0 - 2.1 = 0.9$**
 - Cl and Cl **$3.0 - 3.0 = 0.0$**
- Predict whether valence electrons will be transferred, shared equally or shared unequally between the atoms in each bond below.
 - Na and Cl **transferred**
 - P and Cl **unequal**
 - Cl and Cl **equal**
- Classify each bond as either ionic, polar covalent or nonpolar covalent.
 - Na and Cl **ionic**
 - P and Cl **polar covalent**
 - Cl and Cl **nonpolar covalent**

STATION 6: Answers

1. Identify each compound as either ionic or molecular.
2. Name each compound.

NH₃ – molecular- nitrogen trihydride

NaCl- ionic – sodium chloride

Na₂O – ionic- sodium oxide

PCl₅ – molecular- phosphorous pentachloride

CCl₄ – molecular – carbon tetrachloride

H₂O – molecular- water

MgO- ionic- magnesium oxide

3. Examine the pictures of ionic compounds vs. molecular compounds.
 - a. What do all ionic compounds have in common?

Repeating patterns

Cubic organization

- b. What do all molecular compounds have in common?

One central atom

Sharing of electrons

Station 7: Answers

1. Which substance melted first?

Sugar

2. Which substance has the highest melting point?

Salt (Sodium Chloride)

3. The substance with the highest melting point (#2), has what type of bond?

Salt (Sodium Chloride) is an Ionic Compound

4. Complete the statement:

Ionic compounds have **HIGHER** melting points than molecular (covalent) compounds.